

CLAIMS

What is claimed is:

1. A humidification system for providing substantially micro-organism free
5 water vapor into an airflow conduit flowing a quantity of air therethrough, said
system comprising:

a vessel for containing a quantity of water, wherein the water contains
micro-organisms;

an oven for containing said vessel and heating said water to a
10 temperature, and for a duration, sufficient to at least substantially remove said
micro-organisms and to generate a substantially micro-organism free steam; and

a vapor outlet conduit for channeling said substantially micro-organism
free steam into said airflow conduit to humidify said air flowing through said
airflow conduit.

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2. The system of claim 1, further comprising a controller for turning on
and off said microwave oven.

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3. The system of claim 1, wherein said oven comprises a microwave
oven.

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4. The system of claim 1, further comprising a water drain line in
communication with said vessel for allowing said quantity of water to be drained
from said vessel.

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5. The system of claim 4, further comprising a vacuum accumulator in
communication with said water drain line for assisting in withdrawing said quantity
of water from said vessel through said water drain line, and at least temporarily
containing said quantity of water.

6. The system of claim 1, further comprising a water supply conduit in
communication with said vessel for supplying said quantity of water to said
vessel.

7. The system of claim 6, further comprising:
a valve disposed in said water supply conduit; and
a controller for controlling said valve to allow only said quantity of water to
5 be admitted into said vessel.

8. The system of claim 1, further comprising:
a water drain line for draining said quantity of water from said vessel;
a valve disposed in said water drain line; and
10 a controller for controlling said valve to drain said quantity of water
contained in said vessel at a predetermined time.

9. The system of claim 1, further comprising a humidity sensor in
communication with the vapor outlet conduit for detecting a level of humidity in
15 said air flowing in said airflow conduit.

10. The system of claim 1, further comprising a vapor injection nozzle for
receiving said substantially micro-organism free steam from said vapor outlet
conduit and dispersing same into said air flowing through said airflow conduit.

20 11. The system of claim 10, wherein said vapor injection nozzle
comprises:

a plurality of vanes, said vanes being subject to said air flowing through
said airflow conduit such that said vanes cause said air flowing in said airflow
25 conduit to swirl to thus help in dispersing and intermixing said substantially micro-
organism free steam with said air.

12. The system of claim 1, further comprising a water overflow conduit in
communication with said vessel for receiving any of said water contained in said
30 vessel that overflows from said vessel during heating of said water by said oven.

13. The system of claim 1, wherein said water overflow conduit includes a
pressure relief valve for allowing a flow of said water through said water overflow

conduit only when a predetermined pressure is reached in said water overflow conduit.

14. The system of claim 1, further comprising:

5 a pressure regulating valve disposed in said airflow conduit for regulating a flow of said steam into said airflow conduit and maintaining a pressure of said steam at a pressure present in said airflow conduit.

10 15. A system for humidifying air being supplied within a confined area, said system comprising:

an airflow conduit for providing a flow of air into said confined area;

a vessel for containing a quantity of water, wherein the water contains micro-organisms;

15 an oven for heating said water in said vessel to a temperature, and for a duration, sufficient to at least substantially remove said micro-organisms and to generate a substantially micro-organism free steam; and

20 a vapor injection system for injecting said substantially micro-organism free steam into said airflow conduit and assisting in mixing said substantially micro-organism free steam with said air flowing through said airflow conduit to humidify said air.

16. The system of claim 15, further comprising a controller for turning on and off said oven.

25 17. The system of claim 15, wherein said oven comprises a microwave oven.

18. The system of claim 15, further comprising a water supply conduit for supplying said quantity of water to said vessel.

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19. The system of 18, further comprising:

a valve disposed in said water supply conduit; and

a controller for controlling said valve to admit only said quantity of water into said vessel, said quantity representing a volume of water sufficient to fill said vessel to a desired level.

5 20. The system of claim 15, further comprising a water drain conduit for draining water from said vessel.

21. The system of claim 20, further comprising a valve disposed in said water drain conduit for controlling a draining of water from said vessel.

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22. The system of claim 21, further comprising a controller for controlling said valve such that said water in said vessel is only drained therefrom after being heated by said microwave.

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23. The system of claim 15, further comprising a water overflow conduit in communication with said vessel for draining water that rises above a predetermined level in said vessel, from said vessel.

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24. The system of claim 15, further comprising a humidity sensor for sensing a level of humidity in said air flowing in said airflow conduit.

25. The system of claim 15, further comprising a water level sensor for sensing a level of water in said vessel.

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26. The system of claim 15, further comprising a vacuum accumulator in communication with said vessel for assisting in draining said water from said vessel after said water has been heated for a predetermined time.

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27. The system of claim 15, wherein said vapor injection system comprises:

a vapor outflow conduit in communication with said vessel; and

a plurality of vanes disposed in a path of said air flowing through said airflow conduit to cause a swirling of said air flowing in said airflow conduit to assist in dispersing said substantially micro-organism free steam into said air.

- 5 28. The system of claim 15, further comprising;
 a pressure regulator valve for regulating a pressure of said steam entering said airflow conduit.

29. A system for supplying substantially micro-organism free humidified air to a predetermined area, comprising:

5 a water supply conduit for supplying water, said water having a quantity of micro-organisms therein;

a vessel for containing a predetermined quantity of said water supplied by said water supply conduit;

10 an apparatus for heating said vessel to kill at least a substantial portion of said micro-organisms in said water and to cause a steam to be generated, said steam being at least substantially free of said micro-organisms; and

a nozzle for intermixing said steam with air flowing into said predetermined area to form a substantially micro-organism free, humidified airflow into said predetermined area.

15 30. The system of claim 29, further comprising using a humidity sensor for sensing a level of humidity in said humidified airflow.

20 31. The system of claim 29, further comprising using a controller for controlling an amount of water admitted into said vessel through said water supply conduit.

32. The system of claim 29, further comprising using a controller for controlling a draining of water from said vessel.

25 33. The system of claim 29, further comprising using a water overflow conduit in communication with said vessel for draining water from said vessel that exceeds a predetermined upper level in said vessel.

34. A method for humidifying air flowing into a predefined area, comprising:

5 filling a vessel with a quantity of water, wherein the water has quantity of micro-organisms;

 sufficiently heating the water within said vessel to kill a portion of said micro-organisms in said water and to generate a steam having a reduced quantity of micro-organisms therein; and

10 injecting said steam in air flowing toward said predefined area to produce a substantially micro-organism free, humidified airflow.

35. The method of claim 34, further comprising:

 controllably draining said water from said vessel only after said water has been heated for a predetermined time period.

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36. The method of claim 34, further comprising monitoring a humidity of said air flowing toward said predefined area.

20 37. The method of claim 34, further comprising using a controller to controllably admit and drain water from said vessel.